

**(PCT Article 36 and Rule 70)**

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
    - ☐ international search (Rule 12.3 and 23.1(b))
    - ☐ publication of the international application (Rule 12.4)
    - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
  - ☐ the international application as originally filed/furnished
  - ☒ the description:
    - pages 1-10 \_\_\_\_\_ as originally filed/furnished
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☒ the claims:
    - nos. \_\_\_\_\_ as originally filed/furnished
    - nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
    - nos.\* 1-10 \_\_\_\_\_ received by this Authority on 14.04.2005 with letter of 11.04.2005
    - nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☒ the drawings:
    - sheets 1/6-6/6 \_\_\_\_\_ as originally filed/furnished
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
    - sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (specify): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages \_\_\_\_\_
  - ☐ the claims, nos. \_\_\_\_\_
  - ☐ the drawings, sheets/figs \_\_\_\_\_
  - ☐ the sequence listing (specify): \_\_\_\_\_
  - ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/002184

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO
Inventive step (IS)	Claims	<u>2-6, 8, 9</u>	YES
	Claims	<u>1, 7, 10</u>	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO

## 2. Citations and explanations (Rule 70.7)

1. The following documents are mentioned in the present report; the numbering given below will be used throughout the rest of the procedure:

D1: US-A-5334342

D2: US-A-6277756

D3: WO-A-0109579\*

\* D3 is cited in the international search report.

2. The present application fails to meet the requirements of PCT Article 33(1), since the subject matter of claims 1 and 7 does not involve an inventive step as defined by PCT Article 33(3).

2.1 D1, which is considered to be the prior art closest to the subject matter of claim 1, describes (cf. in particular figure 6L and the corresponding text and column 8, lines 40 to 59) a micromechanical device comprising in combination all the technical features of claim 1. The micromechanical device (cf. figure 6L) comprises at least one suspended element (80) attached to a substrate (62) by a pillar having a base and a

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	<p>top (cf. "central hub" 80). The substrate comprises a recess etched into a substrate and opening onto the surface of the substrate opposite the suspended element (cf. the recess created by etching: column 9, lines 48 to 52 and figure 6G); said recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 6L).</p> <p>Consequently, the subject matter of claim 1 differs from this known device in that at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves.</p> <p>The problem that the present invention is intended to solve can therefore be considered to be that of producing an alternative recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess described in D2, for example, to provide a more stable anchoring area than the one described in D1.</p> <p>2.2 Claim 7 differs from the original claim 9 (cf. claim 1 paragraphs 2.2) in that the grooves are produced by alternating steps of C4F8 passivation and SF6 etching.</p>

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	<p>These additional features are known from D2 (cf. column 7, lines 12 to 29) and therefore do not confer inventiveness on claim 7</p> <p>2.3 Furthermore, claims 1 and 7 do not involve an inventive step relative to D3 and D2.</p> <p>D3 describes (cf. in particular figures 14a to 14h and the corresponding text) a micromechanical device (cf. figure 14h) comprising at least one suspended element (378) attached to a substrate (350) by a pillar (371) having a base and a top. The substrate comprises a recess (370) etched into a substrate and opening onto the surface of the substrate opposite the suspended element; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 14h).</p> <p>Consequently, the subject matter of claim 1 differs from this known device in that:</p> <ul style="list-style-type: none"><li>(i) the recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface;</li><li>(ii) at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves.</li></ul> <p>The problem that the present invention is intended to solve can be considered to be that of providing an alternative <i>deep</i> recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the</p>

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	<p>stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess in D2, for example, to provide a deeper recess than the one described in D3. The method of D2 produces a recess with grooves and ribs and the oxide film does not have the effect of smoothing the walls of the recess.</p> <p>Claim 7 describes well-known steps for producing the micromechanical device according to claim 1 and does not therefore involve an inventive step.</p> <p>3. Claims 2 to 6, 8 and 9 meet the requirement of novelty, involve an inventive step and are industrially applicable (PCT Article 33).</p>